PROGRESS REPORT 149

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

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PRELIMINARY REPORT

GEOLOGY AND MINERAL RESOURCES OF SOUTHERN SOMERSET COUNTY

By

NORMAN K. FLINT

P38.17
2.4

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF INTERNAL AFFAIRS

GENEVIEVE BLATT, *Secretary*

TOPOGRAPHIC AND GEOLOGIC SURVEY

CARLYLE GRAY, *State Geologist*

1956

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where the Upper Kittanning coal is mined in the Carselman Rives valley of the Rockwood-Garrelmanville area are well as in Upper and Lower Turkeytown townships. It is known as the "Twin Seams" or "Two C" coal because the bed is divided into two benches by a narrow clay parting. In the vicinity of Listonburg the parting is not present but the bottom one or two feet of the bed is composed of black, locally known as "blackjack" which is referred to mining. Massive roofstone overlies the coal in the Listonburg area. Throughout the extent of the bed, it is underlain by a rather persistent limestone bed known as the Johnstown limestone. This rock was formerly based for lime but is not at present because higher quality limestone within the area can be produced more economically.

Lower Freeport (Pee coal)

The Lower Freeport coal is the western part of the mapped area is not as persistent as either the Upper Kittanning or the Upper Freeport coal. In the western part, the Lower Freeport has a thickness of about 3 1/2 feet and is notable in certain places along the Allegheny Mountains. On the east flank of Negro Mountain it has been mined at places such as Garrett and north of Brotherton, where it has been extensively stripped. Although texture thin in some places the coal may be profitably mined because it generally lacks partings of non-coaly material.

Upper Freeport (Pee coal)

The Upper Freeport coal is not generally mineable along the Allegheny Mountain or, except locally, on the east flank of Negro Mountain. The coal is of good quality and is about 4 feet thick west and northwest of Gerrardsville, Maryland, where it is known as the "Beachy" coal.

Southeast of Somerset in the area north of Cover Hill, the Upper Freeport coal has been both deep mined and strip-mined.

East of Centreville, along the valley of South Glade Creek, the coal lies under shallow cover in the central area of a structural dome, and it has therefore been extensively strip-mined. In that locality, the coal is 3 to 3 1/2 feet thick and generally contains no appreciable non-coaly partings. Southward from there, however, along the Carselman River at places like Fort Hill and Hillsdale, the Upper Freeport becomes two-bench coal. The lower bench is slightly less than one foot thick and the upper bench about 3 feet thick. The two benches being separated by about four feet of clay. The previous of the preferred clay parting in the region for the Laurel name, the Fire-clay seam. The Upper Freeport is similar to Upper and Lower Tuckaybo township along Laurel Hill Creek valley where the coal is mined at Humbert and Urema.

Conemaugh Series

Nearly all the Conemaugh coals have been worked on a small scale at one or more places. Some of the operations have been started with large-scale mining in mind but have failed because of the inaccessibility of the coals. In the report the Conemaugh coals are mainly those of the Pottsville series. An example of an unprecedented Conemaugh coal is the Mahoning which was formerly mined near Humbert. In places in the Humbert area that coal is 7 feet thick but has variable quality and thins rapidly to less than 2 feet. Other Conemaugh coals are similar, but no exception is the Lower Bakerstown which appears to be the most persistent mineable coal in the western belt of Conemaugh rocks of the mapped area. There the Lower Bakerstown coal ranges in partings are in generally between 2 and 2 1/2 feet thick. Twenty-eight rather is common to thinner for the seam. Since it is to thin if deep-mined with roof of [illegible] but coal can be profitably strip-

mined. In the Berlin area where it is mined, the Lower Bakerstown is commonly known as the Brush Creek coal. A bed which actually lies about 150 feet below the Lower Bakerstown.

In the Garrett-Meyersdale region the Lower Bakerstown is known as the "Silent Valley" coal, and in the Meyersdale-Salisbury area the bed is called the "Honeycomb" coal.

Between the Carselman River and Laurel Hill Creek in the western belt of Conemaugh outcrop, the Lower Bakerstown is persistent but it generally less than 2 feet and therefore is too thin to be mined.

Monongahela Series

Pittsburgh Coal. The Pittsburgh coal, lying at the base of the Monongahela series is known as the "Big Vein" from Meyersdale southward to the city line for an that area the coal is 6 to 11 feet thick. From Meyersdale northward to Berlin it is known as the "Pine Hill No. 2" coal and is only about 4 feet in thickness. Thus range from a 10-foot coal south east of Meyersdale to a 4-foot coal northward of Meyersdale in the region of the deepest part of the upper part of the Pittsburgh bed at that village. The "Pine Hill No. 2" coal, therefore exists only in the lower part of the whole Pittsburgh seam.

Big Vein coal is mostly mined out. The present small-scale mining operations recovering coal left in pillars from previous mining as well as outcrop coal which are left in the ground during the original mining operations. The "Pine Hill No. 2" coal, however, is still being mined.

Pittsburgh Rider Coal. Lying above the Pittsburgh ("Big Vein") "Pine Hill No. 2" coal at an average interval of 35 feet is an unnamed coal which in the Meyersdale-Salisbury area is commonly known as the Redstone. The least Redstone lies 40 feet higher in the stratigraphic section and is underlain by a fresh-water limestone. In the Berlin area the Pittsburgh Rider coal is known as the "Dirty Five" coal. Although the name "Pittsburgh Rider" is not considered a satisfactory one, the coal is so called in this report because it is the first mineable coal above the Pittsburgh bed itself.

The interval between the top of the Pittsburgh Rider coal and the Pittsburgh coal differs from about 50 feet in the Berlin area to less than 5 feet at Newtonville near the Maryland boundary.

Pittsburgh Rider coal is generally 8 to 10 feet in total thickness but the coal is divided into several benches by 1 to 4-foot clay partings. It is common to mine only the bottom bench, which is about 3 feet in thickness and is a fairly clean coal. The coal has been extensively stripped in places each as Good Town, the Walker School area north of Meyersdale and in the Coal Run-Shrock Miner area.

About 25 feet above the Pittsburgh Rider coal lies the 10-foot Redstone limestone which is rarely difficult to remove in some strip-mining operations.

Redstone Coal. A 4-foot coal lying 50 feet above the Pittsburgh coal in the Berlin area but in the vicinity of the Meyersdale at the Redstone coal. In the Berlin-Good Town-Berlinya Mill area where the coal has been rather extensively strip-mined. It is called the "Four Foot No. 1." It generally contains several one-eighth inch shaly partings yet it is one of the higher quality coals of the area.

Lower Seymour Coal. The highest coal exposed in the mapped area is the Lower Seymour, a 20-inch bed which occurs just the top of the highest hillcrest of Good Town and also between Shrock Miner and Coal Run. Because of its thickness the coal has not been mined within its mapped area.

CLAY

Most of the coals have underclays, some of which are fire-clays with economic value. Most of the Allegheny strata are ball and plastic but in places they contain layers of fire-clay that [illegible] of varying purity. Some of the flint clay zones, particularly that in the Lower Allegheny series, is high-quality fire-clay which can be used in making refractory brick.

Flint clay zones of Upper Kittanning can be found in all the outcrop areas of Allegheny rocks. Because flint-clay does not commonly stop out, it is possible and perhaps probable that there are commercial bodies of flint clay other than those described that have not yet been located. Exploration drilling program is required to locate such bodies.

Brookville Fire-clay

Brookville fire-clay or both deep- and strip-mined by the General Refractories Company on the west flank of Negro Mountain 2 1/2 miles northwest of Fort Hill. There the fire-clay average 9 feet in thickness, the lower 3 feet being good quality flint clay, the middle 3 feet being from semi-flint clay zone, and the upper 3 feet being semi-flint clay zone. This fire-clay is shipped outside the area by rail to be used for making refractory products, that from the same bench being used for high-quality refractory brick.

Mr. Savage Fire-clay

Mr. Savage fire-clay (probably Clarion) is strip-mined on Negro Mountain in Garrett County, Maryland, three miles south of the state line. The fire-clay is 2 to 3 feet thick and is used by the Union Firebrick Company at Ironridge, Maryland, for making high-quality refractory brick. The Savage Brick Company formerly mined both the Mr. Savage and Lower Kittanning fire-clays at Glade City near Meyersdale for making refractory brick. It is reported that both beds have been used as "packers" of flint aggregate within the rock-filled "roll" clay. The operation evidently ceased because of the difficulty of recovery.

Upper Kittanning Fire-clay

Two miles northwest of Listonburg (near Silbrugh) another Allegheny flint clay zone, the Upper Kittanning, is being strip-mined by the Garrett Refractories Company. The flint clay zone at that locality has a maximum thickness of 4 1/2 feet in the strip mine, it is being underlain by a bed of soft clay and overlain by 3 feet of soft clay. Above the fire-clay lies the Upper Kittanning coal which is there reported to be about 2 feet thick.

Lower Bakerstown Fire-clay

A plastic Conemaugh clay, the Lower Bakerstown, lying directly below the Lower Bakerstown coal, is used as a small-scale operation for making ball building brick on Tub Mill Run at Compiers Mill. Use of Conemaugh clay for this purpose is somewhat scarce but in general the Conemaugh clays are too impure to make refractory products.

Alluvial Clay

A deposit of soft clay is mined for use in making red building brick and tile a mile north of Springs, a small village 2 1/2 miles north of Garrettville, Maryland. The clay, 15 to 16 feet thick, is interpreted as one which resulted from clay deposition in a recent pond in the lowlands of the tributary to Tub Mill Run that heads at Springs. The source of the pondings is not known.

LIMESTONE

Several limestone beds thick enough to be mined occur in the area. Most of them are in the Upper Conemaugh and Monongahela series, but the important one is present in the below the Coal Measures rocks in the Lower Mauch Chunk group. Although the Coal Measures contain water limestone, these are formerly quarried and burned for lime on a small scale but, lime is now produced only from the Greenbrier limestone at a few favorable localities where this higher quality rock can be quarried

Greenbrier Limestone

Two mineable marine limestones occur in the lower part of the Mauch Chunk group, one are exposed in trenches bed at the base, the other, the Greenbrier, is a persistent limestone 150 feet higher stratigraphically. Both are used for making lime and for road metal.

At present the Greenbrier is mined east of Meyersdale at Keystone, where Pittsburgh Gravel, on the south the Allegheny Mountains. Until recently it was also mined 3 1/2 miles southwest at Keystone where Piney Creek cuts through the Allegheny Mountains. In these two places the limestone is bluish-gray, finely crystalline and sugar from 7 to 10 feet thick. It dips southwest at an angle of about 12 degrees. Impure beds of bituminous limestone are also present in both above and below the 7- to 10-foot-thick bed referred for mining.

Abandoned quarries in the Greenbrier are known in several places such as on Negro Mountain, in Vough Run (Irene Run) valley, at Lake Run valley, and on Laurel Mountain.

At present the lower limestone is being quarried on Negro Mountain, at Pine Hill School. There the bed lying on the crest of Negro Mountain at Hillsdale is generally a fine-grained and is more easily worked than on the Allegheny Mountains where it has a 12-degree dip. Here the bed is about the limestone is 7 feet thick and is finely drusy, greenish gray to dull red limestone which is sparsely fossiliferous. It is overlain by 2 feet of ready limestone red above that by interbedded red and green shale and clay and above of the Black Chert. Directly below the lower limestone of the Mauch Chunk group lies the ready Loyalhanna limestone.

The limestone is of the unassuming limestone is shown by its absence 7 miles northwest of the Negro Mountain quarry where a well drilled for gas near the Lake Run School site penetrated below the horizon of the limestone and did not reach it. Greenbrier was, however, reported in that well as an 11-foot brown-red gray, oolitic limestone. Further evidence for the absence of the lower limestone is present at quarries in the Castelman River valley at the mouth of Lick Run where the stratigraphic position of the limestone is occupied by red shale lying directly on the Loyalhanna limestone.

Loyalhanna Limestone

Between the Mauch Chunk group and the Pocono rendrock lies the persistent 50-foot-thick Loyalhanna limestone, a fine-compound of about one-half carbonate ($CaCO_3$) and one-half quartz (SiO_2) sand. The color of the limestone ranges from gray to dull red to bluish gray or purplish gray. Red is commonly a weathering color. Conspicuous cross-bedding which is quite evident on the weathered surface is characteristic of the formation.

The Loyalhanna has been mined rather extensively on the Castelman River between Garrettville and Kaskaskia and the west of the Negro Mountain roadstone where the underlying and lying red shale along the Youghiogheny River where the stream cuts through Laurel Hill. At present it being extensively quarried for road metal and aggregate in the mile-north of the mapped area on the east flank of Laurel Hill on the roads side. Under in addition to its use as aggregate and road metal the rock is used for paving blocks and railroad ballast.

At any place where the Loyalhanna is mined, the formation has exposures air formed because the blue-round bar been leached by rainfall water and there remains only a residual accumulation of quartz sand, usually red in color. Such a condition should not present for a depth of more than a few feet, however, so that it is likely that the limestone actually occurs at many places where it may appear to be almost at the surface.

SANDSTONE

Sandstones occur at many horizons from the "Catskill" red beds up through the Monongahela series. The area contains many small phenocryst quartzite from which stone was formerly extracted for local use in building stone, for building material, for aggregate, and to some extent for road metal. A few sandstones are quarried and crushed for use as flagstone. Only those that are being worked are described below.

Burgoon Sandstone

The Burgoon sandstone, the upper member of the Pocono group, is flaggy to the upper 15 feet and is quarried for flagstone 1 1/2 miles northeast of Salisbury where Piney Run cuts through Allegheny Mountain. There the sandstone outcrops in 3- to 8-inch-thick red to variegated gray, greenish gray, and dull red. Although fairly bedded, the beds are sufficiently enough to allow the extraction of suitable slabs of good-quality flagstone. The stone is used for house veneer, patios, walks, and for [illegible] in various types of building.

Lizzabeth a similar flaggy sandstone occurs rather prominently at the top of the Pocono, but at some place the cross-bedding makes it difficult to get the rock in large slabs for flagstone production.

Berlin Sandstone

A sandstone lying above the Lower Kittanning coal, the Worthington sandstone is quarried at Edgewood on the southern outskirts of Somerset and also in 1/2 mile southeast of Somerset near the Summit School site. The same formation was formerly quarried at the Berlin Rock Quarry east of Meyersdale. In all those places, the rock has little or no overburden. Although its total thickness is not known, at least 15 feet has been extracted at the Berlin Rock Quarry.

The sandstone is quartzose, medium- to coarse-grained being conglomeratic and is fairly free from iron-staining. It is crushed and used as concrete aggregate mostly.

Pottsville (?) Sandstone

A 20-foot quartzose conglomeratic sandstone is quarried for aggregate in mining concrete block 1 1/2 miles southwest of Springs. Although the stratigraphic position of the sandstone is not known precisely, it is thought to lie above the Upper Kittanning coal. Therefore, coarse-grained sandstone is not horizon is common, particularly in the southern and western parts of the mapped area. Where it is quartzose northward at Springs, the overburden is thin because the rock forms a dip slope on the east flank of Negro Mountain.

Other sandstone occurring at several different horizons have been locally quarried for various uses including flagstone, dimension stone, and aggregate. Certain blocks, particularly those of the Pottsville sandstones, are finished for sewer pipes.

SHALE

The shale use for shale in the area is for road metal for use on secondary roads and driveways. Shales used for that purpose are mostly the marine Brush Creek, Friedenville and Amos shales of the Conemaugh series. These units are commonly 10 to 20 feet thick and are exposed in several pits in which road material has been made. The weathering of the shale from the exposures is rather rapid so that value debris at the foot of a bank can be easily and economically removed.

These shales are fairly dark in color, fossiliferous, and somewhat fissile or brittle. Being thin-bedded and abundantly fractured, they facilate an further breaking after weathering from an exposure.

Although shale is not used for making such products as bricks, sewer pipe, and tile in the area, it is likely that several shale beds within the Pennsylvanian rocks would be suitable for this purpose.

NATURAL GAS

There is no natural gas production in the area at present. Potential producing horizons within reach of the drill are the Oriskany sandstone of Lower Devonian age, the Onondaga limestone in the Middle Devonian, and possibly shallower sands in the Upper Devonian.

The most promising structure in the area are the Negro Mountain anticline and the Laurel Hill anticline. The crest of the Laurel Hill structure lies just west of the mapped area in Fayette County. Another structure, one which produces gas in Maryland, is the Deer Park anticline whose crest parallels Allegheny Mountain and lies four miles east of it.

Each of these structures has been tested either within the area or just adjacent to it. In 1940, the New Penn Development Corporation drilled a well, the Nevi No. 1, located one mile north of Maple Summit School on Laurel Hill. This well was drilled into the Shriver sandstone below the Oriskany sandstone at a total depth of 8,428 feet. From the Shriver there was an estimated potential open flow of 16,000 cubic feet of gas per day. Neither the Oriskany sandstone nor the Onondaga limestone contained any gas. At first oil itself was encountered in drilling the Nevi well. Although there is rather evidence for leaking in the vicinity, those fields that may occur at depth are not well known because of lack of drilling.

The Mentzer No. 1 test well was drilled in 1948 by the Prophet Natural Gas Company on the Negro Mountain anticline between Rockwood and Garrettville at the Lick Run School site. The well was a dry hole which bottomed in the Upper Devonian at 5,135 feet without reaching the Oriskany horizon. In this well the Burgoon (Big Injun) sand was encountered at a depth of 530 feet, the Maxtonville at 880 feet and the Allegheny at a depth of 4,875 feet.

The Prophet Natural Gas Company also drilled a well, the Newmar No. 1, to test the Oriskany on the Deer Park anticline about four miles northeast of Salisbury. This well was a dry hole completed in June, 1953. It penetrated the top of the Oriskany at a depth of 5,624 feet, and had a flow of salt water at a depth of 5,730 feet. About the Oriskany, the top of the 13-foot Tully limestone was drilled at 4,572 feet, and the top of the 104-foot Onondaga at a depth of 5,520 feet. The total depth of the well was 6,307 feet.

Two minor structures highly having closure of less than 100 feet in the Ringwood-Greenville area have not been tested.

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CARLTON CHAS, State Geologist

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PRELIMINARY REPORT
GEOLOGY AND MINERAL RESOURCES
OF
SOUTHERN SOMERSET COUNTY
PENNSYLVANIA

By
TOBIAS K. PRINT [1]

INTRODUCTION

The Area described in this report lies in southwestern Pennsylvania and comprises the major portion of Southern Somerset County. Included in the mapped area is all of the Meyersdale quadrangle, the south of the Confluence quadrangle being in this Somerset County, and the northeast part of the Berlin quadrangle. The geology of the Pennsylvania portions of the Accident, Grantsville, and Garrett quadrangles is also discussed.

Author's 12-minute quadrangles are also discussed.

Geologic field work was done in the summers of 1950 through 1953.

Assisting in the work at various times were J. E. Wessner, T. A. Kohr, W. W. Hamilton, D. M. Beety, and John Reppert. Access in the northeast part of the area was made possible by the cooperation of the Pennsylvania Turnpike Commission.

Acknowledgments are due to the owners of the Pennsylvania Turnpike, Laurel Hill Coal Company, and the Allegheny Mountains Mountain Summit Corporation for permission to use their property. The author is grateful to the above persons and also to those persons in Somerset County who have been helpful in examining data.

TOPOGRAPHY AND DRAINAGE

These topographic prominences in the area are Laurel Hill at the northern edge, Negro Mountain in the center and the Allegheny Mountains in the southern edge. The most rugged topography of the area is found along these northeast-southwest trending ridges. Negro Mountain is relatively high at the Maryland-Pennsylvania line, becoming less and less prominent to the southwest. The highest elevation in Pennsylvania, 3,213 feet, occurs at Mt. Davis on Negro Mountain in Elk Lick Township. At the northern edge of the Berlin quadrangle, where the mountain is narrowest, the summit elevation is less than 2,700 feet. Both Laurel Hill and the Allegheny Mountains maintain summit elevations of about 2,900 feet from the south to the north boundaries of the area.

Major rivers draining the region are the Youghiogheny River, Laurel Hill Creek, and the Casselman River, all of which join at the village of Confluence. Just west of Confluence, the Youghiogheny River cuts a deep gorge through Laurel Hill. Laurel Hill Creek, draining southward, flows in a valley parallel lying between Laurel Hill and the high land of the Centerville-New Lexington-Kingwood area. The Casselman receives several tributaries such as Fall Creek, Sandy Run, and Grassland Glade Run, which flow northwestward off Laurel Hill. The Casselman River enters the area from Maryland, flows northeastward to Meyersdale where it veers to the northwest to cut a deep gorge through Negro Mountain. At Rockwood the stream turns and flows southwestward along Laurel Hill Creek, which in turn joins the Youghiogheny River at Confluence.

The principal tributaries to the Casselman River are Flaugherty Creek, which itself cuts through Allegheny Mountain to enter the Casselman at Meyersdale, Bellefo Creek which enters at Garrett and Coxes Creek which flows southeastward from Garrett to Rockwood. The B & O and Baltimore and Ohio railroads follow Flaugherty Creek, the Casselman and Youghiogheny Rivers from the Allegheny Mountains to Laurel Hill.

STRUCTURE

FOLDING

The dominant structural features in the area are wide, relatively gentle folds which trend in a northeast direction and about N30°E. Named folds within the area are the Laurel Hill, Negro Mountain and Deer Park anticlines and the Berlin, Lower Youghiogheny, and Johnstown synclines. Another structure, an elongate dome for which the name Centerville dome is here proposed, occurs in the northern part of the mapped area. Also present is an unnamed structural terrace showing a flattening of the dip on the exhumed east limb of the Laurel Hill anticline.

Only the east flank of the Laurel Hill anticline occurs in southern Somerset County. From the axial of the structure to Everlite County, the strata dip eastward into the lower Youghiogheny and Johnstown synclines at the average rate of 1-2 degrees, or about 175 feet per mile. Interrupting this general southeastwardly dip is a structural terrace whose long axis trends nearly north from the vicinity of Kingwood to Fort Hill. Topographically the terrace is represented by relatively high, flat land which rests on less resistant rocks. The axial zone of the terrace shows a detailed interpretation of the structure difficult. Southward of Fort Hill the terrace disappears and there is a uniform eastward dip toward the axis of the Lower Youghiogheny syncline. The Negro Mountain anticline extends across the Meyersdale quadrangle from the northwest corner to the southeast corner, plunging continuously toward the northwest. The folds in stellar symmetry in the south but become somewhat asymmetrical northwestward because of the steeper dipping Meyersdale quadrangle from the northwest corner to the southeast corner, plunging continuously toward the northwest. The folds in stellar symmetry in the south but become somewhat asymmetrical northwestward because of the steeper dip on the east limb. Average dip on the east limb is about 250 feet per mile. The dip ranges from 400 feet per mile east of Listonburg to 150 feet per mile southeast of Somerset. In general the axis of the anticline coincides with topographic crests, but in places such as along Elder (Bittersweet) Run along the northeastern of Jerry (Vought) Run, and along Lick Run, the axis follows the lowest gap in a ridge.

The crest of the Deer Park anticline is also outside the mapped area about four miles northeast of the Allegheny Mountain. The rocks dip northward on the Allegheny Mountains which rises topographically high because of erosion. Southward of the Pittsburgh series are at the surface. The average dip on the western limb of the Deer Park anticline is 150 feet per mile (about 3 degrees), a more gentle dip than that of the north edge of the Berlin quadrangle shows. The south end of the Meyersdale quadrangle.

The Centerville dome having structure relief of about 100 feet, extends from the Carrollton River north-northwestward through Gilbert (a small village east of Centerville) north to Somerset. The dome is on the same structural trend as the Berwind-Lance field, a so-called "radial" anticline in the vicinity of Johnstown, 15 miles northeast to the northeast.

The Berlin syncline, the deepest of the synclines in the area, extends from the north boundary of the Berlin quadrangle southward through the village of Berlin and continues at least as far as Meyersdale and Salisbury into Maryland. The feature lies between Negro and Allegheny Mountains and represents a broad and undulating topography in the northern part. Steeper slopes prevail in the southern part because of downcutting by the Casselman River and its tributaries. These are well long, long dip of plunging synclines, the deepest one occurring between Meyersdale and Elder Mills. The other deep one made southward and Good Town near the west edge of the Berlin quadrangle. From the east line to Berlin the dip is 150 feet per mile. Data for lower part of the Monongahela series with the Pittsburgh coal exists.

The Lower Youghiogheny syncline extends from the Youghiogheny River at the northern boundary of the map to a point about one mile northwest of Kingwood where it terminates. It the previously described structural terrace. From the latter southwestward the synclinal axis plunges continuously in Klondike Ridge. The east limb from there to the Maryland line. It is interesting to note that the deepest part of the Lower Youghiogheny syncline roughly coincides with the junction of three streams, Laurel Hill Creek and the Lower Youghiogheny rivers at Confluence.

Only the northern end of the Johnstown syncline is represented. This syncline, which has a regularly plunge, terminates at the Casselman River between the Kings and Fort Hill on extend high end the Centerville dome.

FAULTING

Evidence of major faulting is lacking in surface exposures, but numerous minor faults with displacements ranging from a few inches to few feet may be seen in roadcut airshafts and exposures. The faults are usually obvious, some of which dip vertical distance of 15 to 20 feet.

One of the few examples of a fault of other than a steep minor scrap is the west facing bank of the Buckwood Railroad station. There the Middle Kittanning coal is offset by a normal fault to a vertical distance of about 10 feet. The fault plane strikes N 60 W and dips at an angle of 36 degrees in the southwest.

CLEVAGE ROCKS

Bedrock exposures in the mapped area range in age from Upper Devonian to Upper Pennsylvanian. The oldest exposed beds are those of the "Catskill" red bed, the youngest is the Sewickley sandstone in about the middle of the Monongahela series. The average total thickness of these strata is 3,050 feet. Lithologically the beds are composed of shale, siltstone, sandstone, limestone, clay, and coal, the last three types are most abundant. Unconsolidated alluvial deposits of recent origin are found along the floodplains of the large valleys in the area but are not mapped. Bedrock strata are graphically shown in the Generalized Columnar Section which accompanies the geologic map. Thicknesses of the units shown in the section represent the averages as determined from measurements made both in the field and from drill records.

DEVONIAN SYSTEM

"Catskill" Red Beds (Dcr)

The "Catskill" red beds are above drainage in only two localities in the mapped area. One is on the Negro Mountain anticline where small red patches poor exposures are seen along Pinafore Run and along Whitley Creek upstream from Unamic. The upper 300 feet is exposed in Pearley Run valley at the Negro Mountain anticline axis. Another edge of Catskill outcrops occurs in the Youghiogheny River gorge in Laurel Hill from the Fayette-Somerset county line for a distance of about 0.7 mile upstream. In this locality the upper 500 feet of the "Catskill" is above river level. Interbedded shale, siltstone and sandstone, comprise the "Catskill" red beds with red being the dominant rock color. However, some greenish gray and gray white are interbedded with the red beds. In the report the top of the "Catskill" is drawn at the top of conspicuous red bede without regard to lesser exhibitions. Such a boundary is chosen because it is easily mapped in the field.

MISSISSIPPIAN SYSTEM

Pocono Group (Mp)

Overlying the "Catskill" is the Pocono group which crops out mostly along steep hillsides in the valleys of Bear (Shoemaker) Run, Puzzley Run, and White Creek, and on Pinkstone Mountain in the Negro Mountain anticline area of northern Addison Township. The Pocono outcrop over continuous down Walter Creek to Unamic where the upper part of the formation dips below the creek.

Pocono rocks are also exposed in the Youghiogheny gorge in Laurel Hill and in the Casselman gorge where the Casselman River crosses Negro Mountain. The upper 20 or 30 feet of the Pocono is above drainage in a small ridge about one mile long near the bottom of the Gerrtrimen River valley at the junction of Lick Run. This outcrop is in the axial area of the Negro Mountain anticline.

The Pocono is compared mostly of lime- to medium-grained thin- to medium-bedded gray sandstone but contains minor amounts of siltstone and shale. The Pocono group as used in this report occupies the interval between the Loyalhanna limestone and the top of the conspicuous red beds. The thickness, as determined from a well drilled 3 1/2 miles northwestward of Garrett, is 550 feet. The Pocono sandstone member (Big Injun in driller's terminology) lies at the top of the Pocono and the Murrysville sandstone, a gas reservoir in other areas, lies 350 feet below the top.

The upper 50 feet of the Pocono group is characterized by flaggy, cross-bedded sandstone which in color is variegated between white, brown, yellow, pink, and gray. Where the Pocono crops out on steep hillsides its outcrop is generally covered by a rubble of sandstone occurring as slabby to irregular chunks which range up to a foot or two to size.

Loyalhanna Limestone (Ml)

Because it lies directly above the Pocono sandstone, the Loyalhanna limestone crops out in the same areas as described above for the Pocono. In addition, the Loyalhanna is found at Keystone where Flaughterty Creek cuts through the Allegheny Mountains and also where another stream, Piney Creek, flows through the Allegheny Mountains. The first exposure of the Loyalhanna occurs where the formation has been both quarried and deep-mined on the north side of Casselman River near the mouth of Lick Run. There the formation is 50 feet thick.

The Loyalhanna is a dark-gray to red-brown limestone which contains about one-half coloured quartz grains and one-half calcite. Weathered exposures reveal the conspicuous cross-bedding of the limestone. Commonly the calcite has been leached from the Loyalhanna leaving residual red sandy soil on relatively flat land to mark its outcrop.

Mauch Chunk Group (Mm)

The Mauch Chunk is exposed in the Youghiogheny River gorge, along several edges on the east flank of Laurel Hill, on the Glade Mountain-Winding Ridge area west of Negro Mountain, along the valley of Jeers Run (known locally as Vough Run or Laurel Run), along Lick Run and the Casselman River gorge, and also on the east flank of the Allegheny Mountains.

In the mapped area, the Mauch Chunk can be subdivided into an upper and lower part, the upper part being composed of interbedded predominantly red shale and sandstone, the lower part is a red shale and sandstone sequence containing two mappable limestones. One of the limestones lies at the top of the lower part and is called the Greenbriar limestone in the report. The other member is at the base of the unit and is unnamed. Between these two mappable limestones are other calcareous units ranging from calcareous sandstone to rocks, sandy, limestone. Siltstone locally are found throughout the lower part, being especially abundant in the upper most limestone which appears to be the most persistent of all the calcareous units in the Mauch Chunk of this area. The lowermost limestone is found in the Allegheny Mountains area, and also in the Negro Mountain area west of Mt. Davis, but the exposures of shale where the Casselman River rides through Negro Mountain, for there red shale lies directly above the Loyalhanna limestone. The lower limestone does not occur in the Laurel Hill area where the Mauch Chunk formation is thinner.

The thickness of the Mauch Chunk group ranges from 250 feet at the Fayette County line to 500 feet along Negro Mountain anticline. Along the Allegheny Mountains the thickness of the Mauch Chunk as not ever rarely known, but it is probably about 500 feet.

It is probable that the ground water that supplies the so-called Big Spring, just north of Glade Mountain, discharges from the Greenbriar limestone. Another such spring, called Blue Hole, discharges into the bed of Blue Hole Creek near its junction with Grey Run. At either of these springs, however, if the limestone must exposed.

PENNSYLVANIAN SYSTEM

Pennsylvanian rocks lie discordantly on Mississippian beds and are subdivided into four series, the Pottsville, Allegheny, Conemaugh, and Monongahela. The first three series are represented by a sequence of cyclic units, but only about one-half of the Monongahela series is found in the mapped area. The upper part, being more erosion resistant, differs from others in that they contain coal, and also because they contain numerous rather thin red persistent shale, sandstone, limestone, clay, and coal beds occurring in cyclical sequence. The most valuable coal bede are found in the Allegheny and Monongahela series.

Pottsville Series (Pp)

The accompanying map shows that Pottsville rocks are rather widely distributed on the east flank of Laurel Hill, on the crests and west limb of Negro Mountain, Pottsville sandstone occurs along the highest ridges in the area because of their resistance to erosion. Where these rocks are exposed the area is mostly wooded and relatively unpopulated because the sandstone forms little or no valuable soil for farming, and also because the Pottsville contains no valuable coal bede. On Mt. Davis, territorial Pottsville sandstone underlies the highest point in the State (3,215 feet).

Poor exposures make stratigraphic subdivision of the Pottsville difficult using surface information alone. Wagner (1950) has, however, on the basis of exceptional information in Garrett County, Maryland (which lies immediately southward of the area mapped) subdivided the Pottsville into the following units from the base: Sharon sandstone, Sharon coal group, Lower Connoquenessing sandstone, Quakertown coal group, Upper Connoquenessing sandstone, Mercer coal group, and Homewood sandstone. This subdivision is probably applicable to southern Somerset County.

In southern Somerset County, the Pottsville is 200 feet thick and consists of sandstone such as the Sharon, Lower Connoquenessing and Homewood. Where they crop out it is common to find ultra massive, cliff-like exposures or a rubble of large sandstone boulders. These sandstones are medium- to coarse-grained and locally are conglomeratic. Where shale is one the middle of the Pottsville crop out on dip slopes, sandstone subtile is generally lacking and exposures are scarce. The coal of the Pottsville are typically poor in quality and erratic in thickness yet have been worked on a small scale in a few places, notably in the Berrysville area of Middle Creek Township.

Allegheny Series (Pa)

The lowermost series in which the Allegheny series crop out are along Laurel Hill Creek valley from the north edge of the map south to Unamic, along Coxes Creek valley, along the Casselman River, along the Meyersdale-Rockwood to Hensellville, along the crest of Negro Mountain anticline in the northeastern part of the Meyersdale quadrangle and also along the east flank of that structure from the Plank Road southwestward to the Pennsylvania-Maryland line. The Allegheny strata also crop out along the west flank of the Allegheny Mountains, from the state line to the north edge of the Berlin quadrangle.

Interbedded shale, siltstone and sandstone, comprise the strata from the base of the Brookville coal to the top of the Upper Freeport coal, an interval with an average thickness of 275 feet in the mapped area. In this interval there are 11 different coal beds, five of which are minable. The minable coals in ascending order are the Brookville (A), Lower Kittanning (B), Upper Kittanning (C prime), Lower Freeport (D), and Upper Freeport (E).

In addition to the coals, there are underlayers, rhelas, sandstones, and limestones which along with the coal occur in repeated sequences as shown on the accompanying Generalized Columnar Section. Neither marine beds nor red beds have been encountered in the Allegheny at the mapped area. In this respect the Allegheny differs from the Conemaugh series above.

Conemaugh Series (Pc)

Conemaugh rocks are exposed in two main northeast-southwest trending belts. One extending through the Berlin-Meyersdale-Salisbury area, the other extending through the Centerville-Kingwood-Confluence area.

The Conemaugh series, averaging nearly 900 feet in thickness, extends from the top of the Upper Freeport coal to the base of the Pittsburgh coal. Both marine and non-marine beds are present in the lower part; only non-marine beds occur in the upper part. The cyclical repetition of beds is well developed in the Conemaugh as in the Allegheny and Monongahela series. Although 19 different coal seams are recognized, none of them is minable except a few odd area because of either erratic thickness or poor quality, or both. Three marine units in the lower Conemaugh, the Brush Creek limestone, Friendsville shale, and Amos limestone are valuable as marker bede because they are persistent and are rather easily recognized. Red bede occurring at several horizons within the Conemaugh can be used to a certain extent to correlation.

Monongahela Series (Pm)

Monongahela series rocks are confined to the Berlin-Meyersdale-Salisbury area, where in general they top the highest hills or ridges in the center of the Berlin syncline.

Only the lower 250 feet of the Monongahela series is represented, the upper portion having been eroded. The lower part consists mostly of marine strata but do include three minable coals which from the base are the Pittsburgh, "Pittsburgh Ridge" (incorrectly called Redstone locally), and the true Redstone. Of these coals, the Pittsburgh has been most extensively mined.

MINERAL RESOURCES

Coal is the most important mineral resource in southern Somerset County. Other strata of economic value are clay, limestone, sandstone, and shale. There has been no oil or gas production to date. Each of these resources is briefly discussed below.

COAL

Three seams different coal bede which are generally minable and several others that are locally mined, principally for domestic use. The coals are confined to the Pottsville, Allegheny, and Monongahela series, the best coals occurring in the Allegheny (Lower Pennsylvanian) series and the Monongahela (Upper Pennsylvanian) series. In the following discussion, the different coal beds are discussed in their stratigraphic order and the minable coals are given in their value. The stratigraphic position of each coal and the interval from it to other strata are shown in the accompanying Generalized Columnar Section.

Pottsville Series

The Sharon, Quakertown, and Mercer coals here all been prospected in the area but are not important because of their impurity and irregularity. Mining of the Mercer coal was attempted at Barronvale on Laurel Hill Creek where the coal is 5 feet thick at the outcrop. It also, however, is here but within a few hundred feet to preclude further mining.

The Sharon coal has been mined along Sandy Run in the western part of the area where in places it is 5 to 7 feet thick but contains several 6- to 12-inch shale partings which make it a poor quality coal.

Allegheny Series

Brookville (A) coal

The Brookville coal has been deep-mined rather extensively in the vicinity of Blackfield, four miles east of Rockwood, where the coal appears to be of good quality. The coal is generally 3 to 6 feet thick, but is not high-quality coal owing to the presence of numerous thin shaly partings.

Brookville coal in the vicinity of Mackelton appears to be of similar thickness to that of the Blackfield area, but has not been mined extensively at Mackelton because of its inferior quality.

Lower Kittanning (B) coal. Lower Kittanning coal is mined at numerous places along the outcrop which is shown on the accompanying map. The majority of mines, however, are small-scale operations. On the west slope of the Allegheny Mountains, notable localities where Lower Kittanning coal is mined are near Roxbury, MacDonaldton, and Glade City. Lower Kittanning is also mined north of Garrett and east of Rockwood on the east and west limb of the Negro Mountain anticline respectively. In those two areas the coal has good quality and is about 4 feet thick, containing a 3- to 6-inch shale parting.

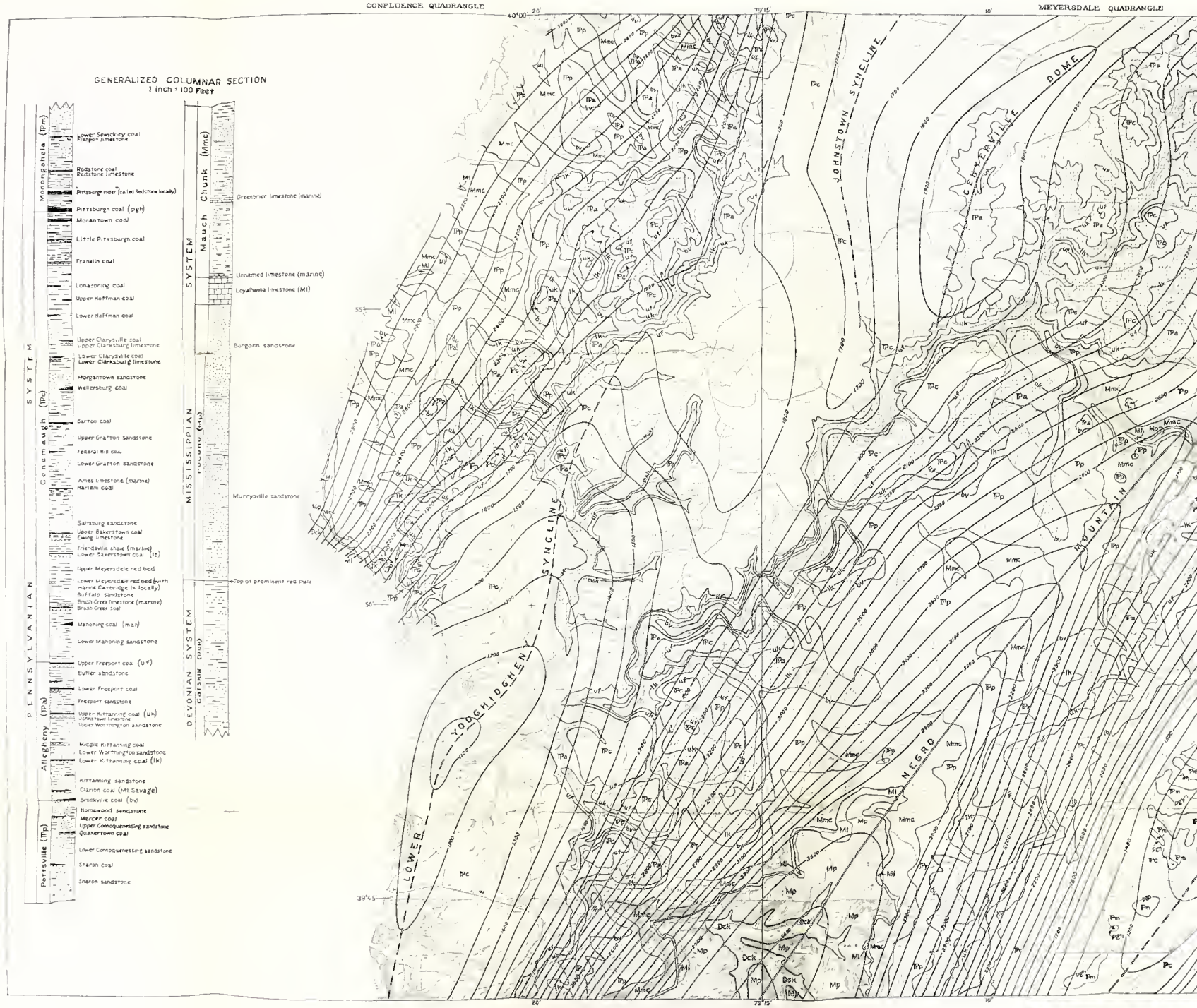
Another area in which Brookville coal has been mined is along Laurel Hill Creek valley west of Kingwood. The coal is generally 3 to 6 feet thick, but is not high-quality coal owing to the presence of numerous thin shaly partings.

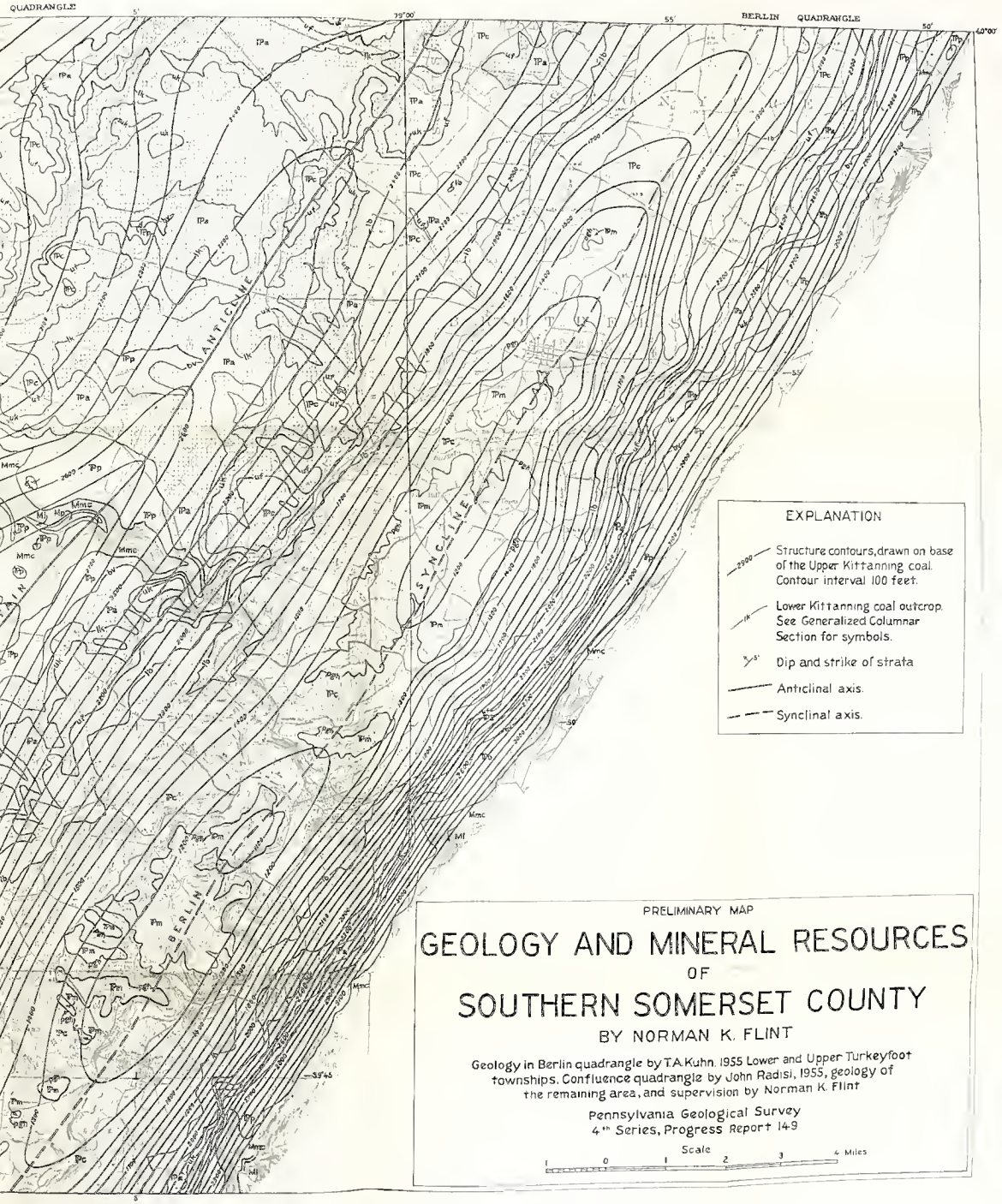
Another locality for mining the Lower Kittanning coal is along Coxes Creek northwest of Rockwood. Although the coal is 4 to 5 feet thick, only the upper 32 inches are mined as the bottom coal has high ash content.

In the western outcrop area of the Lower Kittanning, in the vicinity of Drakeiown and along Laurel Hill Creek valley, the coal is generally about 2 feet in thickness and therefore is too thin for extensive mining.

Upper Kittanning (C) coal. Upper Kittanning coal, because of its persistence, is used as a datum on the accompanying map. It is an important bed in southern Somerset County, averaging slightly more than 4 feet in thickness and is mined throughout most of its outcrop area. Along the Allegheny Mountains the coal averages 4 1/2 feet in thickness and has been mined near Roxbury and northeast of Meyersdale. Where it lies under shallow cover in the central area of the Negro Mountain anticline east of Somerset, the coal has been rather extensively strip-mined. It is mined also along the east flank of the anticline at Garrett and elsewhere.

[1] Geologist, Bureau of Bituminous Coal Research, Pennsylvania Geological Survey.


CONFLUENCE QUADRANGLE
MEYERSDALE QUADRANGLE
GENERALIZED COLUMNAR SECTION
1 inch = 100 Feet
PENNSYLVANIAN SYSTEM
Monongahela (Pm)
Lower Sewickley coal
Pittsburgh limestone
Redstone coal
Redstone limestone
Pittsburgh rider (called Redstone locally)
Pittsburgh coal (pgh)
Morantown coal
Little Pittsburgh coal
Franklin coal
Lonaconing coal
Upper Hoffman coal
Lower Hoffman coal
Upper Clarksville coal
Upper Clarksburg limestone
Lower Clarksville coal
Lower Clarksburg limestone
Morgantown sandstone
Wellersburg coal
Conemaugh (Pc)
Barton coal
Upper Grafton sandstone
Federal Hill coal
Lower Grafton sandstone
Ames limestone (marine)
Harlem coal
Salisbury sandstone
Upper Bakerstown coal
Ewing limestone
Friendsville shale (marine)
Lower Bakerstown coal (lb)
Upper Meyersdale red bed
Lower Meyersdale red bed (with marine Cannelsburg ls. locally)
Buffalo Sandstone
Brush Creek limestone (marine)
Brush Creek coal
Allegheny (Pa)
Mahoning coal (mah)
Lower Mahoning sandstone
Upper Freeport coal (uf)
Butler sandstone
Lower Freeport coal
Freeport sandstone
Upper Kittanning coal (uk)
Worthington limestone
Upper Worthington sandstone
Middle Kittanning coal
Lower Worthington sandstone
Lower Kittanning coal (lk)
Kittanning sandstone
Clarion coal (Mt. Savage)
Brookville coal (bv)
Pottsville (Pp)
Homewood sandstone
Mercer coal
Upper Connoquenessing sandstone
Quakertown coal
Lower Connoquenessing sandstone
Sharon coal
Sharon sandstone
MISSISSIPPIAN SYSTEM
Mauch Chunk (Mmc)
Greenbrier limestone (marine)
Unnamed limestone (marine)
Loyalhanna limestone (Ml)
Burgoon sandstone
Pocono (Mp)
Murrysville sandstone
Top of prominent red shale
DEVONIAN SYSTEM
Catskill (Dck)
JOHNSTOWN SYNCLINE
CENTERVILLE DOME
YODGHIOGHENY SYNCLINE
LOWER
NEGRO MOUNTAIN
40°00'
20'
79°15'
10'
55'
50'
39°45'


QUADRANGLE
BERLIN QUADRANGLE
ANTICLINE
SYNCLINE
BERLIN
EXPLANATION
Structure contours, drawn on base of the Upper Kittanning coal. Contour interval 100 feet.
Lower Kittanning coal outcrop. See Generalized Columnar Section for symbols.
Dip and strike of strata
Anticlinal axis.
Synclinal axis.
PRELIMINARY MAP
GEOLOGY AND MINERAL RESOURCES
OF
SOUTHERN SOMERSET COUNTY
BY NORMAN K. FLINT
Geology in Berlin quadrangle by T.A. Kuhn, 1955 Lower and Upper Turkeyfoot townships. Confluence quadrangle by John Radisi, 1955, geology of the remaining area, and supervision by Norman K. Flint
Pennsylvania Geological Survey
4th Series, Progress Report 149
Scale
1 0 1 2 3 4 Miles

miles southeast of Somerset near the Summit School site. The same formation was formerly quarried at the so-called Bare Rock Quarry east of Murdock. In all those places, the rock has little or no overburden. Although its total thickness is not known, at least 15 feet has been extracted at the Bare Rock Quarry.

The sandstone is quartzose, medium- to coarse-grained being conglomeratic locally and is fairly free from iron-staining. It is crushed and used as concrete aggregate mostly.

Freeport (?) Sandstone

A 20-foot quartzose conglomeratic sandstone is quarried for aggregate in making concrete block 1 1/2 miles southwest of Springs. Although the stratigraphic position of the sandstone is not known exactly, it is thought to lie above the Upper Kittanning coal. Massive, coarse-grained sandstone at that horizon is common, particularly in the southern and western parts of the mapped area. Where it is quarried northwest of Springs, the overburden is thin because the rock forms a dip slope on the east flank of Negro Mountain.

Other sandstones occurring at several different horizons have been locally quarried for various uses including flagstone, dimension stone, and aggregate. Even float blocks, particularly those of the Pottsville sandstones, are crushed for sand in places.

SHALE

The chief use for shale in the area is as road metal for use on secondary roads and driveways. Shales used for this purpose are mostly the marine Brush Creek, Friendsville and Ames shales of the Conemaugh series. Those units are commonly 10 to 20 feet thick and are exposed in several places where road cuts have been made. The weathering of the shale from the exposures is rather rapid so that talus debris at the foot of a bank can be easily and economically removed.

These shales are fairly dark in color, fossiliferous, and somewhat fissile or brittle. Being thin-bedded and abundantly fractured, they require no further breaking after weathering from an exposure.

Although shale is not used for making such products as bricks, sewer pipe, and tile in the area, it is likely that several shale beds within the Pennsylvanian rocks would be suitable for this purpose.

NATURAL GAS

There is no natural gas production in the area at present. Potential producing horizons within reach of the drill are the Oriskany sandstone of Lower Devonian age, the Onondaga limestone in the Middle Devonian, and possibly shallower sands in the Upper Devonian.

The most promising structures in the area are the Negro Mountain anticline and the Laurel Hill anticline. The crest of the Laurel Hill structure lies just west of the mapped area in Fayette County. Another structure, one which produces gas in Maryland, is the Deer Park anticline whose crest parallels Allegheny Mountain and lies four miles east of it.